



## Editorial

## Inserting the angler into catch-and-release angling science and practice



In August of 2015 recreational fisheries researchers, managers, and stakeholders assembled at the American Fisheries Society Annual Meeting in Portland, Oregon to discuss the current state of catch-and-release angling science and practice in the 21st century. Beyond providing a venue for participants to share the latest science on the topic, there was a strong emphasis on understanding how the science relates to or could inform practice. Over the past several decades our understanding of the factors that influence the fate of fish released by anglers has grown. Indeed, there are now well over 300 studies on the topic covering a diversity of marine and freshwater species (Cooke and Suski, 2005). A number of patterns emerge from that literature (see Muoneke and Childress, 1994; Bartholomew and Bohnsack, 2005; Cooke and Suski, 2005; Arlinghaus et al., 2007) but one of the more notable ones is the influence of angler behaviour on outcomes (e.g. fish condition, health, fitness, and survival). Angler behaviour can be manifested in gear selection (e.g. hook type, bait type), time and location of fishing (e.g. predator presence, season, depth), and how an angler interacts with a fish once it is captured. In other words, it is necessary to put more emphasis on the angler when conducting and applying catch-and-release science. In this special issue of “Fisheries Research” we share a number of papers under the title of “Inserting the Angler into Catch-and-Release Angling Science and Practice”.

Many of the contributed papers studied various aspects of angler behaviour and how that behaviour affected fish that were caught and released. Notably, many of them represent “firsts”, filling important knowledge gaps. For example, Pullen et al. (2017) presented one of the first assessments of the extent to which lure retention (e.g., from break-offs or when line is cut intentionally by angler) influenced the physiology, behaviour, and survival of northern pike. Using cameras mounted on fishing line, Gutowsky et al. (2017) revealed how angler behaviour and fish behaviour interact to influence capture success and deep hooking. Research also extended to evaluating whether assisted ventilation during the release process influenced recovery and survival (Brownscombe et al., 2017A). All of these studies can guide anglers on best practices to reduce stress and mortality on caught and released fish.

A number of studies focused on obtaining data on the catch-and-release of fish (species and sources) that heretofore have not been well studied. For example, Gagne et al. (2017) presented the first study of golden dorado catch-and-release based on studies in Argentina, while Fertner et al. (This Issue) conducted one of the first catch-and-release studies on Atlantic halibut in Nordic waters. Kerr

et al. (2017) studied brook trout but the novelty was the fact that the research occurred in the wild relative to most of the previous work that has occurred in hatchery ponds or raceways. Also relevant is how these studies were conducted. Arlinghaus et al. (2017) used whole-lake experiments to understand fish behaviour (i.e., northern pike) relative to angler behaviour in the wild. Another interesting paper examined the extent to which metals or other materials used in the production of fish hooks can accumulate in fish tissues representing an issue for human health (Alós et al., 2017).

The final suite of papers focused on the direct engagement with anglers. For example, Bower et al. (2017) summarized workshops used to engage stakeholders in India when developing a research agenda related to catch-and-release angling of mahseer. Adams (2017) summarized existing research on catch-and-release for saltwater flats fish (e.g., bonefish) with an emphasis on the process by which it was collected (involving extensive angler engagement) and how the science can be used in a decision-making framework to assess fishery sustainability. Danylchuk et al. (2017) surveyed members of the recreational fishing industry (e.g., manufacturers, outfitters) to help understand their perceived role in promoting responsible angling practices. In a separate paper, Sims and Danylchuk (2017) did content analysis of websites of angling-oriented non-governmental organizations in the United States revealing a need to better assist such organizations in sharing responsible angling practices. Finally, Brownscombe et al. (2017B) reviewed literature on catch-and-release science but from the perspective of the angler to identify best practices in terms of tools and tactics that can be shared with anglers.

Moving forward, there is certainly greater need to work more closely with individual anglers, angling organizations, and the angling industry given that it is largely the angler's behaviour that determines the condition, health, fitness, and survival of the fish after a catch-and-release angling event. This special issue drew attention to the role of angler behaviour in influencing outcomes (which is an emerging theme in recreational fisheries more broadly; Arlinghaus et al., 2013), addressed key knowledge gaps related to several species and topics, and enhanced our understanding of the ways in which the angler can be better integrated at the center of catch-and-release science and practice. Engaging anglers to help reveal research needs and priorities (e.g., Bower et al., 2017) and then thinking carefully about how information generated can be best shared through partnerships with industry (Danylchuk et al.,

2017) and angling organizations (Sims and Danylchuk, 2017) represent great opportunity. Similarly, involving anglers in the research process (i.e., citizen science; see Gagne et al., 2017, for example) is also particularly important to ensure that the research has relevance to those who will be affected by the outcomes.

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